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10/656,885	09/05/2003	Seong-Won Cho	GAIN2.002C1	1556

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EXAMINER

SCHAFFER, JONATHAN C

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	02/21/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 02/21/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/656,885

Applicant(s)

CHO, SEONG-WON

Examiner

Jonathan C. Schaffer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-47 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 23-47 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Response to Amendment

1. Applicant's response to the last Office Action, filed 10/16/2006, has been entered and made of record.
2. Claims 23-47 have been added. Claims 1-22 have been canceled. Claims 23-47 are currently pending.

Response to Arguments

3. Applicant's arguments filed 10/16/2006 have been fully considered but they are not persuasive.
4. The Applicant argues that neither Daugman nor Daubechies teaches or suggests segmentizing a piece of iris data into smaller pieces after wavelet transforming it. The Applicant further suggests that neither Daugman nor Daubechies teach or suggests wavelet transforming the segmentized smaller pieces of iris data.
5. In response the Examiner would like to point out that wavelet transforms are used to segment according to both Daubechies as well as the Applicant's own original claims. Daubechies discloses applying wavelet transforms to both the original image as well as the subimages which would be able to continue to segment the image data into subimages and subimages of subimages at least until there is no more image data to create subimages from. In view of this fact it appears that the applicant has in fact broadened their claims by being less specific in how the original image data is segmented. Since the original references taught the original claims they still teach the now broadened claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

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matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 23-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daugman (U.S. Patent Number 5,291,560), in view of Daubechies et al. (Image Coding Using Wavelet Transform, IEEE Transactions on image processing, Vol. 1, No. 2, April 1992).

23. (New) A method of processing an iris image data, the method comprising:

providing data representing an image of an iris of an eye;

Daugman discloses an iris image processing method, which provides data representing an image of an iris Fig. 1.

segmentizing the data into a plurality of segment datas, which comprises a first data representing a first segment of the image;

Daugman discloses dividing the image of the iris into multiple data segments (Fig. 2), which includes a first segment of the image.

performing a wavelet transform on the first segment data, thereby producing a wavelet representation of the first segment data;

Daugman discloses performing wavelet transforms (Fig. 4A-C) on all segments of the data including the first one.

further segmentizing the first segment data into a plurality of subsegment datas, which comprises a first subsegment data representing a first subsegment of the image, the first subsegment being a part of the first segment; and

Daugman discloses performing wavelet transforms (Fig. 4A-C) on all segments of the data including the first one. Daugman however does not specifically disclose segmenting the subsegments into further subsegments. Daubechies does however disclose segmenting the subsegments into further subsegments in the course of a Daubechies wavelet transform which is used in image coding, which would include an image of an iris. It would have been obvious to one of ordinary skill in the art to which the applicant's invention pertains to use a Daubechies wavelet transform in place of Daugman's original wavelet transform for the reasons suggested in Daubechies publication itself, to save CPU time.

performing a wavelet transform on the first subsegment data, thereby producing a representation of the first subsegment data.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature. Illustrated well in Fig. 8, 17 and 20.

24. (New) The method of Claim 23, wherein, prior to further segmentizing the first segment data, the method further comprises determining to further segmentize the first segment data based on the wavelet representation of the first segment data.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

25. (New) The method of Claim 23, wherein the plurality of segment datas further comprises a second segment data representing a second segment of the image other than the first segment, and wherein the method further comprises performing a wavelet transform on the second segment data, thereby producing a wavelet representation of the second segment data.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

26. (New) The method of Claim 25, wherein, subsequent to performing the wavelet transform on the second segment data, the method further comprises determining not to segmentize the second segment data based on the wavelet representation of the second segment data, and wherein the first segment comprises more information on iris pattern than the second segment.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

27. (New) The method of Claim 25, wherein, the method further comprises determining whether to segmentize the first segment data and the second segment data, wherein the method selects the first segment data for segmentizing while not selecting the second segment data for segmentizing, and wherein the wavelet representation of the first segment data has more low frequency components than the wavelet representation of the second segment data.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

28. (New) The method of Claim 23, wherein the wavelet transform on the first segment data or the first subsegment data comprises a Daubechies wavelet transform.

See the rejection of claim 23 fourth limitation.

29. (New) The method of Claim 23, wherein the method further comprises performing a wavelet transform on the others of the plurality of subsegment datas in addition to the wavelet transform of the first subsegment data, thereby producing wavelet representations of the others of the first subsegment data, and wherein each of the plurality of subsegment datas represents a portion of the first segment of the image.

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Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

30. (New) The method of Claim 29, further comprising determining whether to further segmentize each of the plurality of subsegment datas into a plurality of data pieces based on the wavelet representations of the plurality of subsegment datas, wherein each wavelet representation comprises frequency components.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

31. (New) The method of Claim 30, wherein determining comprises characterizing the wavelet representations based on the frequency components thereof in two perpendicular directions on an image of the first segment.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

32. (New) The method of Claim 31, wherein the wavelet representations are characterized as one of HH, HL, LH and LL, wherein HH represents high frequency components in a first direction and a second direction on the image of the first segment, the first and second directions being perpendicular to each other, wherein HL represents a high frequency component in the first direction and a low frequency component in the second direction, wherein LH represents a low frequency component in the first direction and a high frequency component in the second direction, and wherein LL represents low frequency components in the first and second directions.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

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33. (New) The method of Claim 32, wherein determining to further segmentize subsegment datas, the wavelet representations of which are characterized as LL.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

34. (New) The method of Claim 32, further comprising creating a characteristic vector of the iris image, wherein the characteristic vector comprises information of at least one of the plurality of subsegment data that is characterized as HH.

Daubechies discloses after the initial step of wavelet transform the next step the wavelet coefficients are vector quantized which reads on forming a characteristic vector (pg. 205, col. 1, l. 13). Also see Daubechies Fig. 5, 6 and 7 and their supporting literature.

35. (New) The method of Claim 34, wherein the characteristic vector comprises information of a data segment characterized as LL.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

36. (New) The method of Claim 23, further comprising creating a characteristic vector of the iris image, wherein the characteristic vector comprises information of at least one of the plurality of segment datas.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

37. (New) The method of Claim 36, further comprising quantizing values of the characteristic vector.

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Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

38. (New) The method of Claim 36, further comprising processing the characteristic vector to determine whether the iris image matches a pre-registered iris image.

Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

39. (New) The method of Claim 38, wherein the Characteristic vector is processed together with a characteristic vector of the pre-registered iris image to produce an inner product of the characteristic vectors.

Daubechies Fig. 5, 6 and 7 and their supporting literature, Daubechies discloses after the initial step of wavelet transform the next step the wavelet coefficients are vector quantized which reads on forming a characteristic vector (pg. 205, col. 1, l. 13). Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

40. (New) The method of Claim 38, wherein the iris image is determined to match the pre-registered iris image when an inner product of the characteristic vector and a characteristic vector of the pre-registered iris image is greater than a predetermined threshold value.

Daubechies Fig. 5, 6 and 7 and their supporting literature, Daubechies discloses after the initial step of wavelet transform the next step the wavelet coefficients are vector quantized which reads on forming a characteristic vector (pg. 205, col. 1, l. 13). Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

41. (New) The method of Claim 23, further comprising repeating a segmentization and a subsequent wavelet transform prior to the next segmentization, wherein in each repetition, the

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segmentization segmentizes a piece of data into a plurality of smaller pieces of data, the piece of data representing a piece of the image, each smaller piece of data represents a portion of the piece of the image, wherein in each repetition, the wavelet transform is performed on each segmentized piece of data.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

42. (New) The method of Claim 41, wherein repeating the segmentization and wavelet transform a predetermined number of times, wherein the total number of wavelet transforms on datas comprising representation of a position in the image is from 2 to 7.

Disclosed in Daubechies Fig. 5, 6 and 7 and their supporting literature.

43. (New) A device for use in processing iris image data, comprising:

means for providing data representing an image of an iris of an eye;

See the rejection of claim 23.

means for segmentizing the data into a plurality of segment datas, which comprises a first segment data representing a first segment of the image;

See the rejection of claim 23.

means for performing a wavelet transform on the first segment data, thereby producing a wavelet representation of the first segment data;

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See the rejection of claim 23.

means for segmentizing the first segment data into a plurality of subsegment datas, which comprises a first subsegment data representing a first subsegment of the image, the first subsegment is a part of the first segment; and

See the rejection of claim 23.

means for performing a wavelet transform on the first subsegment data, thereby producing a wavelet representation of the first subsegment data.

See the rejection of claim 23.

44. (New) The device of Claim 44, further comprising means for creating a characteristic vector of the iris image, wherein the characteristic vector comprises information of at least one of the plurality of segment datas.

See the rejection of claim 23.

45. (New) The device of Claim 44, further comprising means for processing the characteristic vector to determine whether the iris image matches a pre-registered iris image.

Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

46. (New) A device for processing iris image data, comprising

an input module configured to receive data representing an image of an iris of an eye; and

See the rejection of claim 23.

an iris image processing module configured to perform the method of Claim 36; and

See the rejection of claim 36.

47. (New) A security system comprising:

the iris image data processing device of Claim 46; and

See the rejection of claim 46.

an image matching module configured to process the characteristic vector to determine whether the iris image matches a pre-registered iris image.

See the rejection of claim 45.

Claim Objections

8. Claim 44 is objected to because of the following informalities: It depends on itself. The Examiner will assume for examining purposes that the applicant intended the claim to depend on claim 43.

Appropriate correction is required.

9. Claim 46 objected to because of the following informalities: The claim ends in an "and" without any additional limitation following it. The Examiner will assume for examining purposes that this was just an extra "and" added as a typographical error and will disregard it. Appropriate correction is required.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

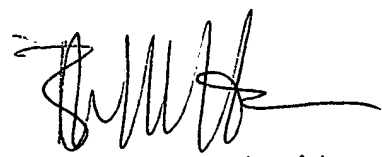
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan C. Schaffer whose telephone number is (571)272-0603. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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